

AMENDMENTS TO THE DRAWINGS

The attached sheet(s) of drawings includes changes to Figs. 4, 5, 6, 11 and 12a .

Attachment: 5 replacement sheets

REMARKS

Claim 11 has been amended. Claims 1- 14 remain in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Claim Rejections - §112

The Examiner states that the limitation “the area of the first [sic] separately addressable sub-pixel is not substantially a multiple of the area of the first addressable sub-pixel” renders claim 1 unclear. Applicant assumes this is a typographical error and the Examiner meant to quote the actual claim language – “the area of the second separately addressable sub-pixel is not substantially a multiple of the area of the first addressable sub-pixel”.

The Examiner suggests that it is not clear whether the area of the first addressable sub-pixel is smaller than a second addressable sub-pixel. Applicant respectfully disagrees. The claim language states explicitly that “the area of the first separately addressable sub-pixel is smaller than the area of a second separately addressable sub-pixel”. Consequently the claim language eliminates any confusion as to the relative sizes. The limitation the Examiner objects to makes it clear than the second (larger) sub-pixel is not a multiple of the first (smaller) sub-pixel.

The term “multiple” is a term well known to those skilled in the art. The term “multiple” requires a particular relationship between two numbers. For example, X is a multiple of Y if X can be divided by Y a certain number of times without remainder, i.e. $X = nY$ where n is an integer. Support for this definition is also set out in the current application at page 5, lines 8 – 11, for example.

Therefore, a person skilled in the art would understand that it is entirely possible for the area of the second sub-pixel to be larger than the area of the first sub-pixel without the area of the second sub-pixel being a multiple of the first pixel.

As to how one would arrange the area of second sub-pixel to not be a multiple of the area of the first sub-pixel, a person skilled in the art would understand this is simply a matter of

choosing appropriate sizes for the relevant electrodes, which the skilled person would be very able to do.

The Examiner also suggests that the terms “ $2:2n+1$, $n:2n+1$; or $n+1:2n+1$ ” render claim 11 unclear as it is not clear whether n is an integer or not. It is respectfully submitted, however, that a person skilled in the art would understand that n is an integer because n is defined in this claim as “the number of latching regions.” To make this explicitly clear, claim 11 has been amended to recite that n is an integer corresponding to the number of latching regions.

It is therefore respectfully submitted that the claims are in compliance with the requirements of 35 U.S.C. §112.

Drawings

The Examiner indicates that the informal drawings are not of sufficient quality to permit examination. However, in response to the previous Office Action, formal drawings were supplied. Applicants request clarification as to whether the previously submitted formal drawings are of sufficient quality and, if not, the specific aspects of the formal drawings that are deemed of insufficient quality.

The Examiner objects to the drawings as failing to show every feature of the claims. The Examiner suggests that the features; “the area of a second sub-pixel is not substantially a multiple of [the] area of the first addressable sub-pixel”, “an addressing means or [sic] selectively addressing the sub-pixels..” and “the area of each separately addressable sub-pixel is not [a] multiple of [the] area of the next smallest separably [sic] addressable sub-pixel” are not shown in the drawings.

Applicants respectfully submit, however, that Figure 13 clearly shows two sub-pixels where the area of the larger (second) sub-pixel is not a multiple of the smaller (first) sub-pixel. This also shows the features that the area of each separately addressable area is not a multiple of the area of the next smallest sub pixel. Applicants’ position regarding the adequacy of the disclosure in Figure 13 was previously submitted in the amendment responsive to the previous office action.

Applicants respectfully request clarification as to why these previously presented arguments are not sufficient to overcome the objections.

Further Figure 2b was specifically amended in the previous response to show addressing means 14. Applicant respectfully requests clarification as to why the amendment was not sufficient to overcome the objection.

In accordance with the Examiner's indication, applicants will amend Figures 4, 5, 6, 11 and 12a as shown on the attached sheets to label these Figures as prior art.

Claim Rejections - §103

The Examiner has rejected claim 1 as being unpatentable over applicant admitted prior art (AAPA) in view of Lee et al. (USP 6,088,011).

With regard to claim 1 the Examiner is essentially correct in that the applicant admits that it is known to provide a light modulating device having all the features of claim 1 with the exception that the area of the second sub-pixel is not substantially a multiple of the area of the first addressable sub-pixel. The Examiner suggests that Lee et al. teaches this feature and that it would have been obvious for one skilled in the art to modify the ratio of the sub-pixels in the device of the AAPA in view of the teaching of Lee so that white balance can be easily controlled.

It is worth noting however that the prior art referred to on page 21 is USP 6,094,187 which teaches a ferroelectric liquid crystal display device. USP 6,094,187 does indeed teach that a pixel can be divided into areas which are separately addressable, exhibiting so called spatial dither.

It should also be noted that USP 6,094,187 makes it clear that the term pixel as used in therein refers to a monochromatic pixel. Thus in a black and white device the term pixel, as used in USP 6,094,187, refers to an individual pixel of the display. In a color device however where there are different sub-pixels for each color, e.g. red, blue and green, the term pixel means an individual

color subpixel of a color display device. See column 5, lines 1 – 18. The same meaning of pixel is implicit in the present invention.

Therefore USP 6,094,187 teaches how one can use spatial dither, together with analogue states, i.e. selectable transmission/reflection levels, to achieve variable greyscale for a pixel of a single color in a ferroelectric liquid crystal device. USP 6,094,187 teaches that for n analogue levels the relative areas of the addressable sub-pixels should be $1:n:n^2\dots$ see column 8, line 62 to column, 9, line 1. In other words USP 6,094,187 teaches that within a pixel (i.e. a monochromatic pixel) the larger separately addressable areas should be multiples of the smallest addressable area.

Lee et al. teach a color plasma display panel having three different colored discharge cells, R, G & B. The sizes of these discharge cells are adjusted so as to maintain white balance of the device. In particular, when general fluorescent materials are used, it is preferred that the Green and Red discharge cells have approximately the same area but the Blue discharge cell has an area that is 1.5 to 2 times the area of the green or red discharge area (col. 2, lines 41 – 43) to account for the fact that blue luminescent material exhibits lower luminance than red or green fluorescent materials (col. 1, lines 32 – 35). A person of ordinary skill would appreciate that liquid crystal displays do not use fluorescent materials. Therefore, the problem addressed by Lee et al. is not relevant to LCDs. Consequently, it is submitted that the skilled person would have no motivation to seek to combine the teaching of Lee et al. and USP 6,094,187.

To further reinforce this view it is noted that nowhere in Lee et al. is there any teaching that any of the discharge cells has a number of selectable transmission/reflection levels, the number being greater than two. The skilled person would not think that the teaching of Lee et al. is at all relevant to the teaching of USP 6,094,187.

Lee et al. do teach that the blue discharge cell in a plasma display panel may be larger than a green or a red discharge cell and that the area of the blue cell may not be a multiple of the area of the green or red cells. However, USP 6,094,187 teaches that a pixel, for a color device, is an individual color sub-pixel. The skilled person, having USP 6,094,187 in mind and reading Lee et al.

would not consider it relevant in any way to the size of separately addressable sub-pixels of a single color pixel. Indeed Lee et al. fails to disclose or suggest any separately addressable areas within a single color pixel.


Therefore it is submitted that the invention defined by claim 1 is patentably distinct from the prior art. Claim 2 – 12, which depend from claim 1, are patentable for at least the reasons provided above with respect to claim 1.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 527122000300.

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Respectfully submitted,

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Attachments

REPLACEMENT SHEETS